(3 Hours)   [Total Marks : 100]

1. Question no. 1 is compulsory.
2. Solve any four questions from remaining six questions.
3. Make suitable assumption wherever necessary and state them clearly.
4. Figure to the right indicate full marks.

1. (a) What are different applications of Computer Graphics ?   5
    (b) Explain even-odd method for inside test of polygon.   5
    (c) Write Bresenham's line drawing algorithm. Calculate the pixel co-ordinates
        of line PQ using Bresenham's Algorithm, Where P1(20,20) and Q = (10,12)   10

2. (a) Explain Scan Line Polygon fill algorithm.   10
    (b) Explain Parallel and Perspective projection.   5
    (c) Derive the matrix for Rotation about an arbitary point for 2D Rotation.   5

3. (a) Describe Virtual Reality. Expalin types of VR Systems.   10
    (b) Derive mathematical representation for Bezier curve. State their properties.   10

4. (a) Explain Cohen-Sutherland line clipping algorithm with example.   10
    (b) Explain Boundry fill and Flood fill algorithm using 8-connected approach
    and State their advantages and disadvantages.   10

5. (a) Describe Halftoning , Thresholding and Dithering in detail.   10
    (b) Describe the various wrapping techniques.   10

6. (a) Explain the graphical rendering pipeline.   10
    (b) Explain in detail any VR Toolkit.   10

7   (a) Explain Raster Scan Displya and Vector Scan Display.   5
    (b) What are advantagesof 3D morphing over 2D morphing.   5
    (c) List the applications of VR .Expalin any two.   5
    (d) Compare the RGB and CMY color model.   5

Con. 3463–11.

RK–2172

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.

(2) Answer any **four** questions from remaining.

(3) Do **not** write anything on question papers **except** seat no.

(4) Draw the well labeled diagram.

(5) **Each** question carries equal maximum marks **20**.

1. (a) Draw and explain different Network topology.   6
   (b) Explain voice integration technique.   6
   (c) Explain with block diagram Generation and Reception of BPSK.   8

2. (a) What is BFSK ? Draw and explain BFSK T_r and co-herent receiver. Comment 10
       on B-W requirement.
   (b) Prove that probability of error of QPSK is :—   10

   $$P_e = \text{erfc} \sqrt{\frac{Eb}{2\,No}}$$

   Where Eb is bit energy.

3. (a) Explain Traffic Management in ATM.   10
   (b) Draw and explain CDMA in UMTS Network.   10

4. (a) Explain 3G and 4G wireless communication with advantages.   10
   (b) Explain the term Network Architecture with suitable example.   10

5. (a) Draw and explain Architecture of IMS for UTMS.   10
   (b) Derive the equation for BPSK spectrum and draw it. Also plot the geometric   10
       representation of BPSK signal.

6. (a) What is data encryption technique and explain Transposition Ciphers in details. 10
   (b) Differentiate between ASK, PSK and FSK. Write advantages of each.   10

7. Write short notes on (any **three**) :—   20
   (a) Ad-hoc Network
   (b) Firewalls
   (c) Digital Signature and Certificate
   (d) Traffic Policing.

Con. 2910–11.

RK–2169

(3 Hours)   [Total Marks : 100]

N.B. : (1) Question No. 1 is **compulsory**.
      (2) Attempt any **four** questions out of remaining **six** questions.
      (3) Draw **neat** sketches wherever **required**.

1. (a) Explain the following concepts of product design in brief. Concurrent   6
engineering, reverse engineering and standardisation.
  (b) Draw a neat block diagram of horizontal column and knee type milling machine   8
and name atleast eight important parts.
  (c) Explain with neat sketch, point to point and contineous path motion control   6
systems for CNC machines.

2. (a) Explain with neat sketches the following lathe operations : Taper turning, 10
Reaming, Parting and knurling.
  (b) Explain in brief operation of welding and brazing processes. Also write tools 10
and materials required and difference between these processes.

3. (a) Differentiate between thermoplastics and thermosetting plastics.   5
  (b) What is the need of operation planning ? Explain the steps involved in planning   8
a process.
  (c) Write a note on TQM which should include its important principles, elements   7
and advantages.

4. (a) What are control charts ? Explain the control charts for attributes and variables.   7
  (b) Explain with neat sketches open loop and closed loop motion control systems   8
in NC/CNC machines. Also write their advantages.
  (c) List common part design attributes and part manufacturing attributes used   5
to classify the parts in Group technology.

5. (a) Define Robot. What is the need of robot in manufacturing ? What are the 10
components of robots ? List any ten applications of robots in manufacturing.
  (b) Write and explain any ten ergonomic principles concerning physical design 10
of the workstations.

6. (a) What is Enterprise Resource Planning (ERP) ? What is its need and what   8
are its advantages ?
  (b) Explain the seven wastes that have been identified in manufacturing industries   7
in JIT approach.
  (c) Explain the extrusion process with neat sketch.   5

7. Write short notes on :—   20
    (a) Types of capacities in capacity planning
    (b) Difference between product layout and process layout
    (c) Master production schedule
    (d) Role of demand management in make to order environment.

----

ws-Scan Paper -3-7
Con. 3605–11.

RK–2175

(3 Hours)

[Total Marks : 100

N.B.: 1) Question No.1 is Compulsory.
2) Attempt any four out of remaining Questions.
3) Figures to the right indicate full marks.

1. a) Draw Use-case diagram for the Problem statement stated in Appendix A. [05]
   b) Draw State transition diagram for the Object STUDENT for the Problem statement
   stated in Appendix A [05]
   c) Write Use case description for the any use-case for the Problem statement
   stated in Appendix A using format shown in Appendix B [05]
   d) Draw sequence diagram for the same use-case stated in Q1 C. Clearing showing Boundry
   Objects, Control Objects and entity Objects. [05]

2. Define following terms in UML, show UML symbol with one meaningful example.
   (Attempt any Five) [20]
   1. Extend Dependency 2. Node   3. Interface.
   4. Use-case   5. Guard Condition. 6. Composition

3. a) Describe i) Fault and Failure. ii) Stub and drivers used in testing [10]
   b) Draw State Diagram for automatic Transmission system for gears in the car.
   Car can only start in Neutral position. Manual selection is to be done to move to
   either reverse gear or any other upper gear. Upper gears are First, Second, third
   and fourth and changes automatically based on speed of the vehicle. [10]

4. a) What is Framework? Give its types. What are design patterns? [10]
   b) Give one example of single-tone pattern. Write java code to demonstrate it. [10]

5. a) Explain principles leading to good design [10]
   b) Draw class diagram and hence draw Object diagram for the following problem
   statement:-
   A bungalow can have maximum two floors. Each floor has multiple rooms. Each
   room has at least one door and a window. Rooms may be connected by a passage.
   Their can be at most one passage per floor. Rooms can be of type Drawing room,
   hall, kitchen or study room. [10]

6. a) What is Equivalence Class?
   Show Equivalence classes for the java method isLeapYear(int year) [10]
   b) What is Test Case? Identify two test cases based on diagram shown in Appendix A [10]

7. Write short notes on :   [Any TWO]   [20]
   i)   Brainstorming session
   ii) Alpha-Beta Testing
   iii) User-Interface Design.

[TURN OVER

Appendix A

Any student (enquiring, existing, passed) can log on to the system. The student logging in for the first time will get logon id from the system. Student can see schedule, fee structure, apply for the course and can pay fees using CC. Existing student can see any instructions/assignments given by instructors and marks obtained in on-line test. Only senior instructor can conduct on-line test. Center supervisor can assign instructors for the course and can see fees collected and other details. Instructors can see their schedules and list of the students for each course.

Appendix B

Use-case Specification format:

ID:
Use case name:

Actors:

Precondition:

Flow of Events:
Normal Flow:

Alternate Flow:

Post-condition:

P4-Exam-May-11-252
Con. 2945-11.

RK-2178

(3 Hours)

[Total Marks : 100]

N.B: 1) Question No.1. Is compulsory
   2) Attempt any four questions out of remaining six questions.

Q.1.a) Explain objectives and functions of O.S.   (10)
   b) Explain the concept of Kernel and shell in an operating system   (10)

Q.2.a) what is RTOS? Give the classification of RTOS.   (10)
   b)Calculate the Hit and faults Using FIFO and LRU page replacement policies for
   the following page sequence.(2,3,5,4,2,5,7,3,8,7) assume page frame size is 3   (10)

Q.3.a) what is Semaphore? Explain Different types of Semaphores.   (10)
   b) Explain message based IPC with example.   (10)

Q.4.a) Describe the differences among short term, medium term and long term
schedulers.   (10)
   b) What are the various buffering techniques? Explain each in details.   (10)

Q.5.a) Explain preemptive and non preemptive Algorithms.   (10)
   b) Explain dead lock avoidance Algorithm.   (10)

Q.6.a) Explain file accessing methods.   (10)
   b) Define thread? Explain type's threads.   (10)
Q.7) Write short notes on any four of the following :-   (20)
   a) Inode
   b) Race condition
   c) File structure.
   d) Shared memory
   e) Network O.S vs. Distributed O.S

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**.
(2) Solve any **four** questions from the remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** data where **necessary**.

1. (a) What is conditional probability ? Explain Baye's rule. 5
   (b) Explain Inter Symbol Interference. 5
   (c) State and explain Shannon's theorem. 5
   (d) Explain Huffman coding. 5

2. (a) Explain CDF and PDF in detail and compare them. 10
   (b) Draw the following line code formats for a data 1 0 1 1 0 0 1 0 10
       (i) Unipolar RZ
       (ii) AMI
       (iii) Split Phase Manchester
       (iv) Polar Quaternary
       (v) NRZ-S.

3. (a) Draw the block diagram of BPSK transmitter and receiver and explain the working. 10
   (b) Classify and explain the various noises that affect communication. Also explain 10
       the following terms :—
       (i) Noise bandwidth
       (ii) Noise temperature.

4. (a) Draw the block diagram of PCM transmitter and receiver and explain the functioning 10
       with the help of waveforms.
   (b) Explain the following :— 10
       (i) Information
       (ii) Information rate
       (iii) Entropy
       (iv) Channel capacity.
       Consider a telegraph source having two symbols, dot and dash. The dot duration
       is 0·2 sec. and the dash duration is 3 times the dot duration. The probability of
       a dot occuring is twice that of the dash and the time between symbols is
       0·2 seconds. Calculate the information rate of the telegraph source.

5. (a) What is Syndrome decoding ? Draw and explain a Syndrome decoder for an 10
       (n, k) block code.
   (b) Derive an expression for the probability of error for a Binary Orthogonal DPSK. 10

6. (a) Explain signature authentication using Public Key Cryptosystem. 10
   (b) Compare the following :— 10
       (i) Systematic and Non-systematic coding
       (ii) Orthogonal and Non-orthogonal QPSK.

7. Write short notes on :— 20
   (a) Sky Noise Temperature
   (b) Equalisation
   (c) Audio Compression.